CITY OF SUGAR LAND
WATER CONSERVATION PROGRAM

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PREPARED BY:

CITY OF SUGAR LAND

Utilities Department

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EXECUTIVE SUMMARY

Dependable and available water sources have demanded attention as the population of the City of Sugar Land (City) increases and water resources regulations change. The City has been a leader in addressing water resource issues to assure adequate supply for the City's future. In response to the growing need to exercise sustainability in the use of our water resources, the City has created this Water Conservation Program (Program):

- As an effort to mitigate the costs of the partial conversion to surface water as mandated by the Fort Bend Subsidence District (30% by 2013 and 60% by 2025)
- To follow due diligence in reducing water waste on the supply side
- To educate our residents and utility customers on the importance of water conservation
- To promote demand-side conservation.

This Program incorporates both the City Council's Policy on the Promotion of Water Conservation and the City's Water Conservation Plan/Drought Contingency Plan (WCP/DCP) required by the State of Texas. The WCP/DCP requirements (as detailed in Appendix B) form the regulatory impetus for this Program in conjunction with the bearing provided by City's desire to enhance its progress toward water conservation goals with existing and future voluntary programs.

The City of Sugar Land takes pride in delivering top-notch Utility services that include maintaining an efficient water supply system with the purpose of providing superior water quality and quantity. The City's Water Conservation Plan, the City Council's Policy, and this Program are invaluable tools necessary to continue the City's dedication to leading edge, professional delivery of quality water services. The components of this Water Conservation Program have been chosen to continue the City's commitment to providing safe and plentiful water to residents and businesses while at the same time promoting a comprehensive effort to reduce wasted water and efficient use of our water resources.

The City is planning for the phased implementation of new water conservation programs aimed at the development of a more robust and comprehensive approach to promoting consumer driven water conservation. The Water Conservation Best Management Practices (BMPs) identified by the Texas Water Development Board and other sources inspired the proposed program (see Appendix C). City staff have reviewed these suggested practices and identified several that can be adapted for use in a City water conservation initiative, ranging from residential rainwater capture technology to water-efficient technology rebates.

Due to policy stances inherent in the proposed expansion of program elements, this Program's intent is to serve as a guiding document for the City's water conservation future. In addition to the program outlined above descriptions of the City's current conservation efforts, as well as

suggested future programs, are included in this document. While there is no regulatory mandate for the City to maintain a program outside of the elements in its WCP/DCP, the City wishes to incorporate all elements of its water conservation efforts in a single policy document.

A summary of Proposed Programs, including planning dates, implementation dates, and estimated funding is found in APPENDIX D.

TABLE OF CONTENTS

SECTION 1 – PROGRAM OVERVIEW

1.1 Program Purpose 1
1.2 Key Personnel 1
1.3 Regulatory Mandate 1
1.4 Non-Regulatory/Cost-Benefit Impetus 2
1.5 Water Conservation Best Management Practices 3

SECTION 2 –WATER CONSERVATION PROGRAMS

2.1 OVERVIEW 4
2.2 CURRENT WATER CONSERVATION PROGRAMS 4
2.3 FUTURE WATER CONSERVATION PROGRAMS 5
2.4 PROGRAM EVALUATION METHODOLOGY 6
2.5 FUNDING MECHANISMS 8

SECTION 3 –WATER CONSERVATION PROGRAMS

3.1 CURRENT PROGRAMS 9
3.1.1 Universal Metering 9
3.1.2 Water Conservation Rates 9
3.1.3 Plumbing Codes 9
3.1.4 Meter Replacement Program 9
3.1.5 Large Meter Testing Program 9
3.1.6 Emphasis on Short Repair Times 10
3.1.7 Water Wise Program Sponsorship 10
3.1.8 Water Education at Public Events 10
3.2 FUTURE PROGRAMS
3.2.1 System Water Audit and Water Loss Prevention Program 10
3.2.2 Non-Potable / Reuse Water Projects 11
3.2.3 New Construction Graywater 11
3.2.4 Promote Water Conservation Measures in Local Hotels 12
3.2.5 Commercial Kitchen Sink Spray Nozzle Replacement 13
3.2.6 Golf Course Water Efficiency Program 13

3.2.7 Athletic Field and Park Irrigation Conservation Program 14
3.2.8 Water Conservation Branding..... 15
City of Sugar Land Water Conservation Branding and Marketing 15
EPA's WaterSense program 16
H2O to Go Education Program..... 17
3.2.9 Water Efficient Technology Rebate Program..... 17
Residential Small, water saving apparatuses 18
Residential Toilet Replacement Incentives..... 18
Residential Clothes Washer Replacement Incentives..... 19
3.2.10 Water Use and Efficiency Surveys 20
3.2.11 Landscape Design and Conversion (Xeriscaping) Program 21
3.2.12 Rain Water Harvesting Incentive Program 21
3.2.13 Landscape Irrigation Conservation Incentives..... 22
Residential Irrigation System Consultation Program 22
Residential Intelligent Irrigation Incentive Program 23
3.2.14 Water Conservation Coordinator 24

APPENDICES

APPENDIX A - City Of Sugar Land Profile/Background 24
APPENDIX B - Water Conservation Regulatory Background 27
APPENDIX C - Texas Water Development Board Best Management Practices..... 30
APPENDIX D – Proposed Water Conservations Program FY 10 – FY 14 32

SECTION 1 – PROGRAM OVERVIEW

1.1 Program Purpose

The purpose of the City's ongoing and proposed Water Conservation Program elements is twofold, in that they serve to meet the:

- Regulatory requirements of the State of Texas regarding Water Conservation Plans and activities
- City's internal desires to reduce excessive water demand and promote efficient water use.

Background of the City's economic and geographic profile relating to its service base and watershed is located in Appendix A. The following sections establish the responsible personnel, regulatory requirements and the benefits of water conservation that form the basic impetus for this program.

1.2 Key Personnel

The lead City Department for Water Conservation Program implementation is the Utilities Department. However, in order to provide a comprehensive approach to Water Conservation, several other City departments have vital roles to play, including, but not limited to, Public Works, Community and Environmental Services, Engineering, Planning, Parks & Recreation, the City Manager's Office, and Communications.

As the City's Conservation Program becomes established, a Water Conservation Coordinator position will be a necessary addition to the Utilities Department staff. The coordinator will implement and provide oversight, continuation, evaluation, and reporting of all conservation programs, collectively.

In order to utilize City resources collectively during the implementation of the Program, the City will coordinate the Water Conservation Program Activities through the Assistant Utilities Director, Water Resources Manager, and other Utilities Department staff. The Program also calls for furthering City Water Conservation goals through interactions with several third party entities including the Fort Bend Subsidence District, Fort Bend Independent School District, the City's Groundwater Reduction Plan Participants, Keep Sugar Land Beautiful, Coastal Prairie Master Naturalist, Fort Bend County Master Gardeners, and local businesses.

1.3 Regulatory Mandate

The Water Conservation Program is a comprehensive offshoot of the Water Conservation and Drought Contingency Plans the Texas Commission on Environmental Quality and the Texas Water

Development Board require of the City. These requirements form the backbone of the regulatory aspect of the impetus for this program. The required Water Conservation Plan/Drought Contingency Plan, as promulgated under sections of both the Texas Administrative Code and the Texas Water Code require the City compile and submit information regarding water conservation efforts, targeted reduction goals and drought contingency measures.

Further detail regarding the requirements and background of these regulatory requirements are in Appendix B.

1.4 Non-Regulatory/Cost-Benefit Impetus

Water Conservation is an essential element to a well run utility system, providing benefits on many levels, from supply-side infrastructure cost savings to promoting environmental sustainability. A comprehensive Water Conservation Program aims to promote efficiency on both the supply (utility) and demand (consumer) sides of the water use equation.

On the utility/supply side, even modest reductions in average demand, and especially in peak period demands, can result in:

- **Appreciable Cost Saving:** Infrastructure is built to handle peak demands, so demand reductions translate to savings on infrastructure costs as well as operation and maintenance costs (i.e. less electricity, chemicals, etc.). Reducing overall demand reduces the amount of surface water we must produce (under Fort Bend Subsidence District requirements), creating savings in water acquisition and treatment costs. This cost savings also affects the consumer side as individual water use decreases.

- **Secure Future Supplies:** Although the City has worked diligently to secure its future water supply, water availability is tightening on a state level. Our future water supply becomes more secure by reducing the impact of growth on our water supply via demand reductions and more efficient water.

- **Wiser Water Use:** Promoting sustainable/wise use of water resources can also positively affect our environment by reducing water withdrawals and related stresses on our water sources.

The combination of the benefits of this comprehensive Water Conservation Program provides both direct and long-term incentives for implementing its elements.

1.5 Water Conservation Best Management Practices

This Water Conservation Program includes a series of elements targeting both supply (utility side) and demand (consumer side). The basis for these program elements are "best management practices." In forming this Program, the City drew from successful programs in other Cities and from the Texas Water Development Board's list of Water Conservation Best Management Practices.

Appendix C contains information on the Texas Water Development Board's Best Management Practices and the development background of this program. It is important to note that many TWDB recommended practices involve mandatory measures to assure water conservation is accomplished. At this time, programs recommended in this Conservation Program are voluntary. Should voluntary programs not achieve desired decreases in water use, the City may need to consider regulatory measures in the form of a Water Conservation Ordinance.

SECTION 2 – WATER CONSERVATION PROGRAMS

2.1 Overview

The City of Sugar Land currently maintains a series of programs that serve to promote water conservation, primarily on the supply side (the functions and methods involving the Utilities Department's operation and maintenance of the system). As the City moves toward a more robust Water Conservation Program, additional emphasis will be placed on encouraging demand-side (the best management practices and technologies implemented by or affecting the end user directly) conservation through implementation of additional program elements. These program elements will take the form of water conservation Best Management Practices (BMPs) modified for Sugar Land's use from the TWDB's BMP list and from successful programs at other cities. The combination of these approaches will form a more comprehensive Program, and encourage participation of the community, thus gaining the benefit of voluntary assistance in the efforts. Public education and outreach will be a key component to the success of the Program. Through public education, residents gain an understanding of how they can participate and benefit in water conservation and become more informed about water supply issues in their community. An educated public can be a broad base of support for the City's efforts.

2.2 Current Water Conservation Programs

As stated, the City of Sugar Land is currently engaged in promoting water conservation and efficient use of our water resources through several ongoing programs. The details of each program are in Section 3 of this document. In general, the current mix of programs and efforts is weighted toward operations and system management, but does include some educational efforts that target residential water customers. Program elements include:

1) Universal Metering
2) Transient Meter Enforcement
3) Water Conservation Rates
4) Plumbing Codes
5) Meter Replacement Program
6) Large Meter Testing Program
7) Emphasis on Short Repair Times
8) Wholesale Contract Water Waste Provisions
9) Periodic System Water Audits
10) Sponsorship of the Fort Bend Subsidence District's WaterWise water conservation education program, and
11) Water conservation booths at public events like the City's 2010 Environmental Event, 2009 H20 Expo water festival, Trash-Off, Tree Planting, Movie Nights, and retail store demonstrations

While opportunities for growth exist on both sides of the water conservation equation, the City is targeting demand management BMPs and programs for the future. Additionally, the existing Water Conservation Program does not have a centralized management system, but rather, is a collection of individual efforts. Organized tracking is a priority for the City's future Water Conservation Program management.

2.3 Future Water Conservation Programs

In addition to the current water conservation programs already in place, the City reviewed and identified several BMPs as enhancement programs (drawn heavily from the TWDB outlined projects of Appendix C). Section 3 contains program details for each BMP as well as the phased timeline of implementation in Fiscal Years 2010 - 2013. Availability of funds, staffing resources, and logistics involved with the implementation of these projects will determine the schedule for program implementation. Increased general education and outreach efforts will bolster all of the identified conservation programs.

Recommended future Water Conservation Program enhancement programs include:

1. System Water Audit and Water Loss Prevention Program
2. Non-Potable/Reuse Water Projects
3. New Construction Grey Water Usage
4. Promote Water Conservation Measures in Local Hotels
5. Commercial Kitchen Sink Spray Nozzle Replacement
6. Golf Course Water Efficiency Program
7. Athletic Field and Park Irrigation Conservation Program
8. Water Conservation Branding
9. EPA's WaterSense program
10. H_2O to Go Education Program
11. Small, Water Saving Apparatus Availability
12. Residential Toilet Replacement Incentives
13. Residential Clothes Washer Replacement Incentive
14. Water Use and Efficiency Surveys
15. Landscape Design & Conversion (Xeriscaping) Program
16. Rain Water Harvesting Incentive Program
17. Landscape Irrigation Conservation Incentives
18. Residential Irrigation System Consultation
19. Residential Intelligent Irrigation Incentives

More so than the existing efforts, which have been refined over time, many of the new programs will need to be carefully tracked and evaluated to determine cost-efficiency and comparative impact. Therefore, in addition to the future conservation programs listed above and detailed in 3, an evaluation system will be an essential tool for development and refinement of each conservation programs. Section 2.4 deals with the development of this evaluation methodology.

2.4 Program Evaluation Methodology

The City's comprehensive Water Conservation Program, as laid out in this document, is a combination of required and voluntary programs interspersed among several City departments and currently without completely integrated oversight. A common evaluation methodology will be developed in order to ascertain the efficacy of any given component program.

Several existing programs, while serving water conservation ends, also fulfill other purposes, and therefore their efficiency is not wholly a measure of the program. This is true for the majority of the supply management programs. These elements have also existed for a greater degree of time, and have evolved to fit their niches.

Demand management programs are the new focus of the City's water conservation efforts. Many of the new conservation programs aim at quantifiable demand reduction and make evaluation of these programs more feasible. While the following protocols attempt measuring the efficiency of each individual program, it is desirable to evaluate the effectiveness of the Water Conservation Program as a whole. To do so, staff will attempt to compile the cumulative quantifiable reductions of all then-current programs and compare it to the previous year. The comparison will be made by user category (residential, etc.) and measured in percentage reduction.

Therefore, the proposed evaluation methodology for the Water Conservation Program as a whole will be divided between supply and demand management categories, with different techniques for each.

<u>Operation and Supply Management Evaluation</u>

For Operation and Supply Programs, the most quantifiable evaluation will be total system water loss as reported on the annual system water audit, change between previous year's loss and current year's loss, and the percent of supply served by reclaimed water or non-potable projects. These factors encapsulate the aims of most of the listed operation and supply management programs, and are easily quantifiable. Because the majority of the operation and supply management programs are established, the need to quantify results on a project-by-project basis is not necessary, therefore, the staff member administering the Water Conservation Program will make a yearly report based on these measures.

Demand Management Evaluation

As the majority of the demand management elements described in this Program are new and program specific, the focus in their evaluation methodology will be on quantifying results per program. Because the pilot programs have not been refined over years of use, they still need to prove their cost efficiency. Therefore, to the greatest degree practicable, their measure will be in cost per 1000 gallons of water saved. The auditor will, if quantifiable numbers are not readily part of a program's output, find commonly accepted average results from regional and national groups, and extrapolate projected savings from these norms.

Each program will be evaluated by this cost efficiency standard, and also by the number of households impacted. These two measures will give an idea of both the cost/benefit of a given program as well as the potential impact of that program. A small program may have very good cost efficiency, but if it is not scalable to a large-scale impact, it may not be feasible. Pilot programs will be evaluated on a six-month basis, and the resultant evaluation will be included in the yearly evaluation as well as in consideration of budgeting for the next year.

To anticipate yearly fluctuation, staff will also evaluate the demand management programs as a whole to compare against its component programs as well as the supply management elements.

Therefore, the staff member currently administering the Water Conservation Program will make a yearly report that includes:

- supply management evaluations
- evaluations of cost and benefit/impact of each individual program
- budget recommendations for the next year based on these evaluations
- an overall evaluation of the implemented demand management elements as a whole

As an example of applying the demand side evaluation, take the recommended pilot program of water efficient technology rebates. At the end of the program term, the evaluator would write a brief description of the program and its implementation, then quantify the costs of the program in terms of purchases and staff-hours, and compare that number to the benefit, via standard assumed savings or observable savings. This would be the cost effectiveness number for this program.

Next, comparing the cost effectiveness number for the program to the equivalent costs of providing the water in terms of both ground water and surface water (after 2013) and the results of other City pilot programs completed to date or established programs in similar municipalities a determination of program efficiency can be made. For example, if the cost of providing the rebates is $0.15 per 1000 gallons of water conserved, and it would cost $0.27 per 1000 gallons of groundwater produced, then it compares favorably and is feasible. However if another pilot

project came in at $0.10/1000 gallons, it would be less feasible when compared to the first program, still intangible benefits like public participation and program advertisement may be considered to understand the true cost feasibility.

2.5 Funding Mechanisms

A mix of City enterprise funds pays for the current programs included in the City's Water Conservation Program. Currently, the Utilities and Surface Water enterprise funds split education and outreach costs. Several of the existing supply side programs are part of normal Utilities day-to-day operations. Funding for staff members involved with the Water Conservation Program comes from the Utilities and Surface Water funds.

The City of Sugar Land is the Administrator for a group Groundwater Reduction Plan in response to the Fort Bend Subsidence District's surface water conversion mandate. Some of the activities currently underway, or those planned for the future, offer benefits directly applicable to all members of the GRP, rather than just the City's system. For those elements, the Surface Water Fund, to which all the GRP participants contribute, is the proper funding source.

As the City moves forward with the demand management programs, consideration should be given to whether programs will be open to just City residents or to residents of all the GRP participants. That determination will influence whether the City's Utility Fund or the GRP-funded Surface Water Fund is the best funding source for the programs. This Program currently recommends the Utilities Fund cover the costs of supply-side management efforts, but that the Surface Water Fund should increase its share of contribution to the future demand-management programs. As reduction in demand affects all the GRP participants in the same way as non-potable water projects of reclaimed water use, the shared benefit makes the shared cost justifiable, even if the foci of the program are on City residents to begin with. Partnership opportunities with the ETJ communities on some of the demand management elements aimed at retrofits or incentivizing water efficient technology would resolve any issue arising over using Surface Water Funds.

Future program funding will be requested during the City's annual budget process. In addition, the City will also seek out, to the greatest degree practicable, any outside funding or partnership opportunities. Outside funding in the form of federal, state, local, private, and non-profit grant money, and potential application for TWDB and other State water-related funding programs will be pursued. Staff will pursue partnership opportunities with both public and private entities, such as Keep Sugar Land Beautiful and other community/environmental groups, residential and commercial developers, local businesses and private organizations, community service organizations, and shared efforts with other City Departments.

SECTION 3 – WATER CONSERVATION PROGRAMS

3.1 Current Programs

3.1.1 Universal Metering

This element requires that all connections, including temporary connections for construction, etc, are metered either by permanent meters or transient meters. This is already a standing City requirement. The Utilities Department and development regulations manage this element.

Transient Meter Enforcement

As part of the City's universal metering requirements, construction contractors and other short term users drawing water from the City's system need to obtain and use one of the City's transient meters. The transient meters are re-coded by color on a regular basis to ensure identification in the field. Failure to use one of the meters for a temporary connection is enforced initially by the Utilities Department, and then subsequent action as is necessary. This program element is managed by the Utilities Department.

3.1.2 Water Conservation Rates

The City currently has a meter size-based and volume based water conservation block rate. Further evaluation in the future may lead to consideration of further division among meter sizes based on consumption. Management of this program is through the Treasury Division.

3.1.3 Plumbing Codes

The City has adopted the Universal Plumbing Code (UPC), which matches the AWWA standards. These standards guard against, among other things, inefficient water technologies. The City's Community Development and Utilities staffs enforce plumbing codes.

3.1.4 Meter Replacement Program

The City has an existing meter replacement program. As meters age, their accuracy declines. Residential meters are replaced every 12 years, and commercial meters under 2 inches are replaced regularly based on their size. The details of the City's meter replacement program are found in the City's WCP/DCP (Appendix A). The City's Utilities Department manages this element.

3.1.5 Large Meter Testing Program

The City's large meter testing program serves to evaluate the efficiency of large meters at a periodic interval based on the meter size. Utilities Department staff routinely tests large commercial meters for accuracy and repairs meters found to be outside of the AWWA standard.

3.1.6 Emphasis on Short Repair Times

The City's utility systems have integral restrictions on responses to leaks and other water loss events in the system. Our time restrictions are comparatively strict compared to local and state averages. Quicker responses to leaks means less water lost, which equates in turn to a reduction in overall demand. The Utilities Department manages this program.

3.1.7 WaterWise Program Sponsorship

The Fort Bend Subsidence District runs the WaterWise water conservation education program. The program is sponsored by entities regulated by the FBSD, and is a mix of education materials and in-school education presented to elementary/middle school children along with water based curricula.

The Groundwater Reduction Plan participants through the City of Sugar Land sponsor the program in schools within the GRP coverage area. In return for sponsoring the program (currently at a rate of $75,000/year) the GRP receives a dual benefit. On top of the less quantifiable benefit of promoting water conservation through education, the GRP also receives a "credit" of 84,000 gallons against its FBSD mandated conversion volumes for each child it sponsors (~1,526/year). This equates to future cost avoidance, unadjusted for inflation, of approximately $280,000 per year.

Beyond the financial incentive, the WaterWise program represents a turnkey solution for promoting water conservation education in the City, as it requires no effort or review on our part, simply financial sponsorship. After the first year, evaluation of this program reveals this program is a beneficial credit-generating avenue. An increase in sponsorship is recommended as City funding allows.

3.1.8 Water Education at Public Events

City staff makes water and water conservation related presentations to local school students and civic groups, and distributes information at local events. More direct and routine visits to schools and public events will allow for greater exposure of the Department's conservation goals.

For many years, the Utilities Department sponsored the H_2O Expo. The expo was a daylong event focused on educating children about water conservation and other environmental topics in a fun, festive learning environment. Analysis of attendance, cost, and staff hours required indicate the resources expended on the event would be more beneficial if allocated to other education and outreach programs.

3.2 Future Programs

3.2.1 System Water Audit and Water Loss Prevention Program

A System Water Audit and Water Loss Prevention Program is a comprehensive integration of internal water loss programs / procedures under which the City would periodically coordinate and evaluate O&M information to identify and prevent water loss.

This element of the Conservation Program involves periodic evaluations of the utility system specifically geared toward reducing water loss. This is a more integrated version of the regular maintenance and planning conducted by the Utilities Department staff.

Goal: Efficient, Cost Effective Water Production

Benefit: Reduce unaccounted-for water loss
Reduce overall demand
Increase revenue

Time Line: FY14

Cost: ~ 120,000 (FY14 Water CIP request)

3.2.2 Non-Potable / Reuse Water Projects

The City has already identified and undertaken preliminary studies on a number of potential reclaimed water reuse projects. Emphasis under this Program will be innovative planning and leadership efforts to reduce treated water use for irrigation, aesthetic lake filling, and other applications where treated water is not necessary. Irrigation of highway and other public rights of way are a major focus.

Goal: Decrease demand on potable water system

Benefit: There is substantial potential to use non-potable/reclaimed water for non-potable applications previously served by potable water or groundwater wells. Reduction in either would appreciably impact costs under the FBSD conversion mandates. Additionally, utilizing these sources reduces water loss in treatment, and provides greater source flexibility.

Implementation:
The City will continue to identify and evaluate potential non-potable/reuse projects, and add feasible projects to the CIP. The City is currently studying the use of non-potable water for state highway and other irrigation projects.

Time Line: FY11 – FY15

Cost: Dependant on projects selected and available funding

3.2.3 Graywater Reclamation and Reuse

In addition to surface water and ground water sources, graywater (water from sinks, washing machines, showers) can effectively meet water demands of certain applications in the City. Graywater can be safely collected from households to provide water for lake filling or right of way and park irrigation. Graywater use in non-consumption areas of the house such as toilet flushing, and lawn irrigation systems is another possibility. Reclaiming this water for meeting the non-potable water needs requires innovative leadership and changes in current development practices.

Goal: Encourage innovation and leadership in water planning and development for water delivery in new development and re-development

Benefit: Reduces demands on the potable water system
Reuses existing water, instead of purchasing additional water

Implementation:
Discuss with members of the Development Review Committee, developers and builders the potential to incorporate reclaimed water or other non-potable projects into their preliminary designs
Will require City Ordinance and Plumbing Code Changes

Comments: The recommended BMP could either require new homes to install dual piping that provides the capacity to collect graywater from allowable sources and to install subsurface graywater systems around the foundation, or utilize reclaimed or raw surface water for community scale non-potable water projects.

Time Line: FY12-13 Develop

Cost: Minimal staff time for preliminary discussions with developers

3.2.4 Promote Water Conservation Measures in Local Hotels

The City's water conservations efforts can extend to guests visiting our community through partnership with local hotels. Hotels can be a source of hidden water waste. Supporting hotels to reduce laundry loads, repair leaking faucets, use 'low-flow' apparatuses, and make the water conservation message visible can reduce wasted water and decrease the demand on the City's system.

Programs like "Hang Your Towel If You Want to Reuse It", "Report a Leak", and "Less Frequent Linen Changes for Longer Stays", in addition to regularly scheduled plumbing

maintenance inspections are examples of programs the City can encourage and support. Printed "Welcome to Sugar Land" cards with a Water Conservation message is an illustration of City support for these programs.

Goal: Partner with hotels to implement water-conserving programs

Benefit: Reduced demand

Implementation:

- Meet with local hotel management to discuss and evaluate current conservation measures and how the City can support increasing the hotel's conservation efforts.
- Determine if City Ordinance necessary

Time Line: FY11 Develop
FY 12 Implement

Cost: Staff time, potential printing costs (< $500)

3.2.5 Commercial Kitchen Spray Head Change Out Program

An incentive program targeting commercial kitchens, (restaurants, schools, day cares), to swap inefficient sink spray heads with water saving spray heads. A 3-gallon per minute spray head used only 2 hours as day can use up to 131,000 gallons of water annually. Providing low water spray heads (1.2 gal/min) at reduced or no cost will greatly decrease water consumption as well as wasterwater treatment. Monitoring water use will determine program effectiveness.

Goal: Water conservation in commercial kitchens

Benefit: Reduced water demand
Reduced wastewater treatment

Implementation:
Contact commercial kitchens with program details
Meet with kitchen management for installation

Time Line: FY10 Develop
FY 11 Implement

Cost: Staff time

Spray heads $2,500 ($100 x 25 per year)

3.2.6 Golf Course Water Efficiency Program

A program to help reduce water use on Sugar Land golf courses. Program involves meeting with local golf course managers to discuss their water use practices and determine if alternative sources of water such as surface water, scalping plants are feasible for lake filling and irrigation. Components of this program encourage each golf course to:

- develop a conservation plan and conduct water audits and water use surveys
- research surface, and re-use water options

Goal: Partner with Golf Courses to develop water efficient management practices

Benefit: Increase outdoor water usage efficiency
Reduce ground water usage
Save Golf Courses money

Time Line: FY11 Develop
FY 12 Implement

Cost: Staff Time

Comments: Possibility exists for the City to work with third party programs like the Audubon Cooperative Sanctuary Program (ACSP) for Golf program to assist in implementation.

3.2.7 Athletic Field and Park Irrigation Conservation Program

Instituting water conservation measures in City-owned parks and recreational facilities can contributes greatly to the City's overall conservation program. In addition, park facilities are ideal locations to highlight well-managed and innovative systems.

Currently, water conservation is a primary concern in the upkeep of the City's park facilities. Park irrigation systems are designed and some have been retrofitted to optimize water saving, however the opportunity exists to convert existing irrigation systems to more water efficient systems utilizing smart irrigation systems or similar devices to reduce irrigation waste and staff involvement.

An additional element of the Parks Water Conservation Program includes the Parks Department incorporation of water-efficient plant species into existing park landscapes when replacement is necessary and in new parks and streetscapes during design and construction.

Longer term, City parks are primary locations for using reclaimed water for lake filling and irrigation. This program will build upon and expand existing conservation measures into more efficient, water wise systems in the parks.

Goal: Reduce water use in City-owned parks and facilities
Use water reclaimed from wastewater treatment

Benefit: Increasing outdoor water usage efficiency
Reduce demand of potable water
Reuse of reclaimed water
Save City money

Implementation:

- Develop comprehensive written water conservation policies and procedures for athletic field irrigation under the City's Parks Department jurisdiction
- Determine opportunities for retrofitting existing irrigation equipment with water efficient technologies or smart irrigation systems
- Work with sports organizations that lease athletic fields and develop conservation minded field management practices
- Investigate rainwater collection systems to supplement water demand for irrigation
- Explore how reclaimed water can be used in the parks

Time Line: FY11 Development
FY12 Implementation
FY13 Reclaimed water projects

Cost: Staff time
Labor cost and materials dependent of retrofitting projects
Design, engineering, construction for reclaimed water projects

3.2.8 Water Conservation Branding and Marketing

City of Sugar Land Water Conservation Branding and Marketing Campaign

Branding creates program identity and message cohesiveness. Developing an overall image for water use and conservation efforts will carry the conservation message through the introduction and implementation of each component of the City's overall Conservation Program. In addition, developing a program to disperse information (news releases, video, and web site enhancements) can keep the conservation message out in the community at a relatively low cost.

Goal: Build branding for City of Sugar Land's Water Conservation Program
Routinely have conservation tips and water related articles in local media publications

Benefit: Identifies the City's commitment to responsible water resource management and water conservation
Promotes a consistent, identifiable message of conservation

Implementation:

- Develop identifying image
- Incorporate image in each conservation program
- Develop information campaign to local media sources
    - Local papers and magazines
    - Cable TV, and movie theater ads
    - City's Website
    -

Time Line: FY10 and on

Cost: Staff time

EPA's WaterSense program

Launched in 2006, WaterSense, EPA-sponsored partnership program, seeks to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. WaterSense brings together local water utilities and governments, product manufacturers, retailers, consumers, and other stakeholders. Goals of the WaterSense program include:

- Decrease indoor and outdoor water use through the adoption of more efficient products and practices.
- Help consumers make water-efficient choices, including differentiating between products and services in the marketplace
- Encourage consumers to adopt simple daily activities that reduce water use.
- Encourage innovation in manufacturing
- Establish and standardize rigorous certification criteria that ensure product efficiency, performance, and quality.

WaterSense includes a product labeling program to help consumers identify water-efficient products and programs that meet WaterSense water efficiency and performance criteria. WaterSense Partners include manufacturers, retailers and distributors, and municipal utilities, including the Cities of Plano, Frisco, Garland, Irving, Richardson, Allen, College Station, Pflugerville, and Houston.

Joining EPA's WaterSense Program as a Partner is an easy way of building our own water conservation brand. Utilize WaterSense resources rather than creating new ones, help build brand. Incorporating elements of the EPA's WaterSense program and utilizing existing resources and programs from the federal and state government will become the base for clarifying current and future conservation efforts.

Goal: Build branding for water conservation in Sugar Land

Benefit: Identifies the City's commitment to responsible water resource management and water conservation

Implementation:

- Discuss potential of joining as a partner
- Join and utilize program resources.
- Report annually on the City's WaterSense related programs

Time Line: FY10

Cost: Minimal staff time

H_2O to Go Education Program

This Education Program is an expansion of the current water education presentations. It is a 'mobile' spin-off of the H_20 Expo. Instead of a one-day event where children and citizens come to one location, this program will take the 'event' to local schools to support science curriculum and to community groups with speakers, demonstrations, and water related activities.

Goal: Presentations tailored to specific audiences
Community participation in the City's Conservation Programs

Benefit: Citizens knowledgeable in water conservation and water management issues affecting the City

Implementation:

- Develop Water Education Programs applicable for children and adults
- Acquire or Develop materials
- Make contact and schedule presentations to groups (youth and adult)
- Plan presentations based on audience, location, format requested, and time allotted
- Make presentations

Time Line: FY 10

Cost: Staff Time
Materials (~ 2,000 annually)

3.2.9 Water Efficient Technology Rebate Program

A suite of water efficient technology rebate programs promoting water conservation through subsidizing or otherwise providing incentives for replacing household water apparatuses and appliances (toilets and washing machines) that use unnecessarily high amounts of water. Goal of each Rebate Program will be not just replacement of inefficient models, but replacement with upgraded, ultra efficient models. Each program will collaborate closely with local home improvement retailers to promote conservation. Closely monitoring this program's components is imperative to assure cost effectiveness.

Residential Small, Water Saving Apparatuses

Promote the use of more efficient household water apparatuses like shower heads, aerators, toilet flappers and toilet components (like dual flush devices) through a give-away or rebate program. After residents install the devices, Treasury Department's billing system will monitor water usage. Apparatuses or rebate applications will be available at community events, presentations, and at the Utilities office.

Goal: To solicit residential partnerships in water conservation

Benefit: Reduction in residential usage
Reduced wastewater treatment

Implementation:

- Develop program to distribute specific water saving apparatuses
- Establish monitoring format to establish the program's effectiveness

Time Line: FY10 Develop
FY 11 Implement

Estimated Cost: Staff Time
$10,000 for low water apparatuses

Residential Toilet Replacement Incentives

This program promotes water conservation through subsidizing or otherwise providing incentive for replacing residential toilets installed prior to 1995 with qualified low volume modern units.

The modern lower flow toilets represent an appreciable household water savings, up to 9 gallons per person per day, and thus lower water demand.

City will offer a rebate for each approved toilet purchased as an incentive for a homeowner to convert to water efficient toilets. A subsidy allows the City to share the cost of the program with the homeowner, encouraging participation and improving the cost efficiency of the program. A rebate may encourage the homeowner to purchase a more efficient model that may be more expensive. Likely types of approved toilets would be ultra low flush or dual flush models.

Homes constructed after 1995, will not be eligible for this incentive because plumbing codes now require low volume toilets.

Goal: Replace high-volume toilets throughout homes in Sugar Land
Encourage homeowners to replace high-volume toilets

Benefit: Resident: Improve indoor water use efficiency, lower water bill, shared cost
City: Reduced demand
Reduced wastewater treatment

Implementation:

- Plan rebate program (most likely a 'coupon' type program in cooperation with the local home improvement stores
- Procure funding and approval
- Publicize program
- Manage program (coupon distribution, installation verification, rebate payments)
- Monitor water use of participating households

Time Line: FY10 Development
FY11 Implementation

Cost: Dependent on scale of pilot program
Preliminary recommendation is a $100 rebate on new toilets
Maximum pilot scale of 200 toilets; a total of $20,000 per year
Promotion Materials $1,000

Note: This voluntary retrofit program combined with public education initiatives to encourage participation without mandatory compliance, unlike the TWDB recommended BMP that requires developing a city ordinance to trigger retrofitting toilets installed prior to 1995 when ownership of the property changes.

Residential Clothes Washer Replacement Incentive Program

An incentive program promoting residential replacement of inefficient clothes washers with efficient models. This element would offer a subsidy incentive towards the purchase of water-efficient clothes washers that replace high volume washers. The manufacture of high efficiency type washers began in the 90's, showing marked water use savings over traditional models. Intent of the program would encourage participants replacing a machine to 'step up' to an even higher water efficiency rated machine.

Goal: Encourage homeowners to replace high-volume washing machines

Benefit: Resident: Improve indoor water use efficiency, lower water bill, shared cost
City: Reduce demand

Implementation:

- Development and Implementation of this pilot program will depend on efficacy of the Residential Toilet Replacement Incentives

Time Line: FY13 Develop
FY 14 Implement

Cost: Dependent on scale ($150 rebate on new water-efficient washing machines)
$15,000 per year (100 washing machines)
$1,000 Promotional Materials

3.2.10 Water Use and Efficiency Surveys

Under implementation of this program, the City offers free or subsidized water use surveys of residential homes and landscaping to help large volume users identify and curtail water waste.
The water use survey reviews existing water use patterns considering appliances, landscaping and irrigation, and other household requirements. After completing the audit, City staff discusses the survey and shares suggestions for more efficient water use with the resident.

Goal: Participation from top 1% of residential users

Benefit: Increased indoor and outdoor water use efficiency
Reduced demand
Educated homeowners

Implementation:

- Mail letter to 50 high water use* residential customers
  * using more than 20,000 gallons per month during summer
- Schedule and complete surveys
- Prepare Survey Report and meet with customer

Time Line: FY10 (as requested)
FY11 (full implementation)

Cost: Staff Time (equating to $5,000; ~ $100/survey; targeting 50 high user annually)
$1,000 Promotion

3.2.11 Landscape Design & Conversion (Xeriscaping) Program

Native and water efficient species can greatly reduce irrigation volumes. An education and incentive program to promote residential landscaping with native and water efficient plant species. Program includes three components:

1. Distributing water efficient landscaping information to homeowners;
2. Collaborating with parks department, local garden centers, garden clubs, and master gardeners to provide xeriscaping or water efficient gardening demonstrations;
3. Coordinating efforts with City facilities, local businesses or community garden to spotlight examples of water efficient landscaping; and
4. Rebate residents and HOAs for the purchase of water efficient plants.

Goal: Educate residents on using water efficient landscaping

Benefit: Increase outdoor water usage efficiency.
Decrease demand (especially during summer months)

Implementation:

- Provide each new customer and change-of-service customer information on water wise landscape design
- Plan and Provide demonstrations and workshops
- Develop and implement rebate procedures for purchase of water wise vegetation

Time Line: FY 10 Development
FY 11 Implementation

Cost: $2,500 for education component
$10,000 for rebate component

$1,000 Promotion

3.2.12 Rain Water Harvesting Incentive Program

An education and rebate program to promote the use of rain barrels for domestic landscape irrigation via harvested rainwater. Rainwater Harvesting is a new term for an old set of technologies. For centuries, people have collected rainwater in cisterns and their modern cousin the rain barrel to supplement ground and surface water sources. Common modern residential application is the installation of a rain barrel or similar containment device to existing drainage/gutter systems. The collected water then irrigates the landscape, thereby reducing the need for equivalent volumes of treated potable water.

Program includes a phased pilot project that provides a rebate to residents that install a rain barrel system. Rain barrels are $125; program would rebate 50% of cost to the homeowner for up to two barrels. The impact of decreased demands on the City's system will be ascertained comparing historical and current water use data. The City will seek collaboration with HOAs concerning deed restrictions on this pilot program.

In addition, the opportunity may exist to incorporate rainwater harvesting into the Community Garden site, or possibly school or museum butterfly gardens as demonstration sites.

Goal: Promote rain water harvesting
Provide education and support for rain barrel installation

Benefit: Reduced outdoor irrigation demands on the potable water system

Implementation:

- Install a demonstration rain harvesting system at the Community Garden or other location
- Plan and host education and demonstration seminars
- Develop rain barrel rebate or distribution program

Time Line: FY 11 Development
FY 12 Implementation

Cost: $15,000 Rain barrels
$700 Rain harvesting demonstration site
$1,000 Promotion

3.2.14 Landscape Irrigation Conservation Incentives

Irrigation water use contributes a significant amount to demand on the City's potable system. This program provides education and financial incentives to residents for improving landscape irrigation efficiency. As a residential irrigation system ages, water efficiency declines. Periodic evaluation and maintenance on residential irrigation systems will decrease demand on the City's water supply and prevent wasting water.

In addition, newer technology in the form of localized or regional weather based controllers, or rain sensors are potential upgrades residents may consider adding to the system and thus a potential target for a pilot rebate program. Components of this program include:

Residential Irrigation System Consultation

Assistance provided to survey a resident's irrigation system for leaks and inefficiencies. City promotes the check-up program using Water Conservation promotions and rebates to each homeowner $50 for participating. For participating, residents will receive a report of recommended improvements to their system.

Goal: To provide an incentive for residents to repair inefficient irrigation systems

Benefit: More efficient residential irrigations systems
Less demand on the system during peak system

Implementation:

- Collaborate with licensed Irrigation companies on providing irrigation system inspections
- Develop implementation plan
- Promote and coordinate program

Time Line: FY11 Development
FY12 Implementation

Cost: $500 promotional materials
$5,000 per year ($50 per survey x 100 households)

Residential Intelligent Irrigation Incentives

A rebate program that promotes residential uses of "smart" water efficient irrigation controllers (such as WeatherTRAK) that monitor rainfall or soil moisture before irrigating the lawn. Program may entail City installing Weather Stations that residents can access through a private service to control their irrigation system, or rebating residents that upgrade their system to "smart" controllers.

Goal: Promote water efficient irrigation

Benefit: Increase outdoor water usage efficiency
Reduced demand

Implementation:

- Research irrigation systems and controller, costs, and applicability to program
- Determine suitable products
- Develop rebate or collaboration plan

Time Line: FY13 Development
FY14 Implementation

Cost: To be determined

3.2.15 Water Conservation Coordinator

The addition of a water conservation coordinator would deepen implementation and oversight of the City's Conservation Program and allow greater integration and evaluative capacity over the different water conservation programs.

Goal: Staff dedicated to Water Conservation Program

Benefit: A common element in successful conservation programs is a conservation coordinator who is responsible for developing relationships with the public and partnering organizations necessary for greater response and program effectiveness.

Implementation: Identify a Conservation Coordinator, whose duties include the following:

- Manage and oversee development, implementation, and evaluation of conservation programs
- Develop public outreach and marketing strategies for water conservation;
- Document Program status as it relates to state requirements and BMPs adopted;
- Communicate and promote water conservation to utility management;
- Coordinate utility conservation programs with operations and planning staff;
- Prepare annual conservation budget;
- Participate in regional water conservation planning and drought planning initiatives.

Time Line: FY12

Cost: ~$35,000/year + benefits

APPENDIX A
City of Sugar Land Profile/Background

City Organization

The City of Sugar Land, located 20 miles southwest of Houston, is a full-service municipality providing the highest quality of services to meet the needs of its citizens. Sugar Land is an economically vibrant and culturally diverse community of approximately 76,000 residents. The 2000 Census figures ranked the City of Sugar Land number one in growth in the Houston metro area and number one among the state's 45 largest cities.

With the incorporation of the City in 1959, a home rule form of government was adopted. A home rule charter allows the City to make a variety of decisions ranging from the establishment of the type of government, the ability to specify the number of members, the allowance of annexation, the ability to set property tax rates, and the authority to authorize any other function, responsibility, or provision provided they are not specifically prohibited by the state constitution or laws. This gives municipalities like Sugar Land broad powers of enforcement and the ability to establish ordinances and to regulate and promote the various water conservation program elements.

The home rule charter, as amended, provides for a council-manager government, which includes a mayor and six council members who are elected for a term of two years, with a term limit of four consecutive terms. Under this system, Council appoints the City Manager, who acts as chief executive officer of the government. The Mayor and two council members are elected at-large in even years, and the remaining four council members are elected by single member districts in odd years. The Mayor and City Council establish goals and priorities each Fiscal Year, while the City Manager implements those objectives established by the governing body. The City Manager carries out policies and administers City programs.

City Watersheds

The City of Sugar Land is located in both the Brazos River Basin and San Jacinto-Brazos Coastal Basin. In terms of local waterways the City falls in the “Austin/Oyster” sub-basin and Oyster Creek sub-watershed of the San Jacinto-Brazos Coastal Basin and the Lower Brazos sub-basin of the Brazos River Basin.

Upper Oyster Creek

The City’s future surface water supply comes directly from the Upper Oyster Creek, located within the San Jacinto-Brazos River Coastal Basin, southwest of Houston within the northern portion of Fort Bend County. However, the primary source of water for the Oyster Creek watershed will be pumpage from the Brazos River as surface water becomes a more dominant use in the watershed, and therefore, we will indirectly be supplied from the Brazos River Basin

as well. Over the years, Upper Oyster Creek has been significantly modified, and it currently serves as a segment of a water conveyance system operated by the Gulf Coast Water Authority (GCWA). Seasonally, water is pumped into Upper Oyster Creek from the Brazos River to provide agricultural and industrial water resources to the region.

In the near future, additional water supplies will be pumped through Oyster Creek from the Brazos River to serve as the primary potable water source for the City of Sugar Land, adding municipal use to the category of uses served. Surface water traveling through the Oyster Creek watershed will supply approximately 60 percent of the potable water demand for the City and its Groundwater Reduction Plan participants by the year 2025. The City also leases water rights held on Oyster Creek by the Fort Bend County Water Control and Improvement District No. 1 for the future use of non-potable water supply projects for irrigation and lake filling.

The Upper Oyster Creek watershed occupies approximately 278 square kilometers and lies within a climatic region classified as subtropical humid with hot summers and dry winters. The watershed is quickly becoming urbanized and includes portions of several municipalities including Fulshear, Missouri City, Stafford, and Sugar Land. With the numerous urbanized areas located within the Upper Oyster Creek watershed, the watershed is affected by a variety of sources ranging from municipal and industrial wastewater discharges to stormwater runoff.

In June 2001, the Texas Commission on Environmental Quality (TCEQ) initiated two Total Maximum Daily Load (TMDL) studies on Oyster Creek: a bacteria study and a dissolved oxygen study. The TCEQ has conducted these studies as an element of the TMDL program initiated by the Environmental Protection Agency (EPA). Oyster Creek was selected for this program due to its classification as a historically impaired water body and its listing on the Texas 303(d) List for high bacteria levels and low concentrations of dissolved oxygen.

The Upper Oyster Creek Bacteria TMDL was adopted by the TCEQ on August 8, 2007. During the Implementation Phase of the TMDL process, the stakeholders will coordinate with the TCEQ to formulate and implement a plan detailing reasonable best management practices (BMPs) that may help lower bacteria levels in Upper Oyster Creek. As the Implementation Phase progresses, the City will revise the Storm Water Master Plan (SWMP) to reflect TMDL requirements. In addition, the Upper Oyster Creek Dissolved Oxygen TMDL was similarly adopted. Upon completion and adoption of the TMDL study, the stakeholders will coordinate efforts to ensure proper implementation of the TMDL requirements.

Growth in and around this potable source watershed, in the City and its ETJ, the growing scarcity of state water resources, the greater costs involved in treating and distributing surface water, and the ecological impact of greater water withdrawals all offer incentive to promote water

conservation as one tool among many in a comprehensive water supply and quality solution for the City and the region.

The Brazos River

The City's wastewater treatment plants discharge into the Brazos River(far downstream of the pumping station that feeds Oyster Creek to the northwest. The Brazos also serves, as noted above, as the future potable water source for the City. The Brazos is greatly affected by seasonal variation in water quality in great part due to the series of reservoirs operated by the Brazos River Authority. The releases from these reservoirs often include elevated levels of Chlorides.

APPENDIX B
Water Conservation Regulatory Background

The historical focus on water conservation in western water law regimes, and under Texas law has been one of promoting wise land use and preserving scarce resources. The current soil and water conservation districts, for instance, have their roots in the Dust Bowl era of the 30's, when a still agrarian economic base suffered from loss of valuable soil and water resources. As Texas has grown and urbanized, competition for increasingly scarce water resources has led to regulations that have grown from regional to statewide in scope.

The State of Texas requires that municipal water providers submit a Water Conservation/Drought Contingency Plan indicating the steps a provider takes to assure efficient use of their respective water resources. The WCP/DCP serves as the formal summation of the provider's conservation efforts in accordance with the State requirements, and must be updated periodically. Many water-related permit applications require the submission of a current Water Conservation Plan/Drought Contingency Plan (WCP/DCP) as a demonstration of the provider's ability to use wisely the state's water resources, especially in peak demand/drought conditions when both supplies and sources are at their most vulnerable. The State of Texas requires, through both the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB) that the City files a Water WCP/DCP, updated on a periodic basis, that details how the City promotes efficient water in its public utility system and curtails inefficient water use during drought conditions. The mandate and requirements for this Plan are found in the Texas Administrative Code (TAC) Chapter 288 regulations as amended by the TCEQ and in applicable sections of the Texas Water Code (TWC). TCEQ Rule Project No. 2007-025-288-PR was put in place because of language regarding changes to Water Conservation Plan requirements in Senate Bill 3 and House Bill 4, passed during the 80th Legislature. The WCP/DCP adopted by the City reflects these regulatory changes as well as the City's current water conservation efforts. The current mandated requirements for the WCP/DCP are described in the following.

The requirements of the WCP/DCP have recently undergone changes as mandated by Senate Bill 3 and House Bill 4 in the 80th Texas Legislature. The primary thrust of these changes is for increased attention and oversight of water use by providers, and is encapsulated in the aforementioned omnibus water bills which themselves focus heavily on increased management of depleting resources, both in terms of water supply and ecological sustainability. The preeminent structural changes are that WCP/DCPs must now be submitted to both the TCEQ and the TWDB with progress reports made on an annual basis, and that more specific evaluations of progress on water conservation targets must be made. Sub-section 1.3.2 details the current requirements of the WCP/DCP as well as how they are addressed by the City. As noted

previously, the required elements of the WCP/DCP do not reflect the entirety of the City's approach to water conservation, but do present to the state a measure for oversight.

Water Conservation Plan/Drought Contingency Plan Requirements

The current requirements for Municipal Water Systems similar to the City of Sugar Land are promulgated under Chapter 288 of the TAC and applicable chapters of the TWC, as established by the last Legislature. The City of Sugar Land's role as a water provider has altered since the last time this Plan was compiled and submitted to the state in 2005. At the time, the City served solely municipal uses, and thus followed the TCEQ's template for municipal use providers. In the interim, the City's water supply uses have grown to include agricultural/irrigation contracts and other non-potable water uses. the water provided for these uses is leased from other water rights holders, and therefore its use should be covered under their Water Conservation Plans. However, as the City is subleasing the water to other users we have included language in this Program and in our WCP to address how we are managing water use in these non-potable uses. Our primary aim is to reduce waste via contractual obligation, but further BMPs will be developed as we evaluate this relatively new role as a non-potable water provider.

The following are the general elements required by the TCEQ and the Texas Water Development Board TWDB:

Water Conservation Plan: The WCP must contain:

- A utility profile indicating the size/nature of our utility customer base, utility components, general City information, water use data, source and treatment data, and corresponding information for the wastewater system.
- Specific, quantified 5/10-year targets for water conservation
- Metering devices accuracy information
- A statement regarding implementation of universal metering
- A statement regarding the utility's measures to determine and control unaccounted-for use of water
- A statement regarding continuing public education and information
- A statement regarding the implementation or adoption of a non-promotional water rate structure
- Evidence of official adoption of the WCP/DCP
- A statement regarding coordination with a Regional Planning group
- A statement regarding an established program for leak detection, repair and water loss accounting
- A statement regarding record keeping for water use data

Drought Contingency Plan: The DCP must contain (individually or in conjunction with the WCP):

- Specific, quantified targets for water use reductions (new requirement)

- Drought response stages
- Triggers to begin and end each stage
- Supply management measures
- Demand management measures
- Descriptions of drought indicators
- Notification procedures
- Enforcement procedures
- Procedures for granting exceptions
- Public input to the plan
- Ongoing public education
- Adoption of plan
- Coordination with regional water planning group

Appendix C
Texas Water Development Board Water Conservation Best Management Practices

Municipalities and regional water providers have implemented a myriad of initiatives in their development of comprehensive Water Conservation Programs. These initiatives are often formulated as Best Management Practices; structural or non-structural initiatives implemented to manage a given resource or issue in a practical and feasible way that is generally recognized to be most efficient by experts in a given field. City staff reviewed a selection of existing programs from other entities in addition to evaluating our current efforts. By evaluating programs that have already been implemented or reviewed by other water providers, the City may benefit in learning from others mistakes and successes as we move forward with our own pilot programs.

In particular, staff reviewed the list of Water Conservation Best Management Practices identified by the Texas Water Development Board. In response to legislative mandate in 2004, the TWDB identified, as part of its general list, a series of BMPs designed specifically for Municipal Water Systems.

While many of these BMPs are general in nature, City staff identified several on the TWDB list that could easily be adopted for the City of Sugar Land. There were some items that are already part of the City's water conservation efforts, as will be detailed in later sections, but the majority of the new pilot programs the City has identified are derived from this state document. It should be noted that the TWDB BMP list is not a mandated regulator document, but rather, a resource for state water providers. As such there is not related reporting or regulatory compliance in drawing from this list. However, these BMPs are specific to Texas and therefore already pre-selected to be better fits for Texas municipalities than programs from other areas of the country with different water situations.

This Water Conservation Program is based on the BMP model of using those operational, structural and educational initiatives that have been tested and selected for efficiency and impact. The Program strives to create a robust mix of these strategies to comprehensively address water conservation in the City of Sugar Land.

The following is the Texas Water Development Board's BMPs for Municipal Water Users:

1. System Water Audit and Water Loss
2. Water Conservation Pricing
3. Prohibition on Wasting Water
4. Showerhead, Aerator, and Toilet Flapper Retrofit
5. Residential Toilet Replacement Programs
6. Residential Clothes Washer Incentive Program
7. School Education

8. Water Survey for Single-Family and Multi-Family Customers
9. Landscape Irrigation Conservation and Incentives
10. Water Wise Landscape Design and Conversion Programs
11. Athletic Field Conservation
12. Golf Course Conservation
13. Metering of All New Connections and Retrofit of Existing Connections
14. Wholesale Agency Assistance Programs
15. Conservation Coordinator
16. Water Reuse
17. Public Information
18. Rainwater Harvesting and Condensate Reuse
19. New Construction Graywater
20. Park Conservation
21. Conservation Programs for Industrial, Commercial, and Institutional Accounts
22. Cost-Effectiveness Analysis for Municipal Water Users

APPENDIX D

Proposed Programs

		Develop	Implement	FY 10	FY 11	FY 12	FY 13	FY 14	Notes
Demand	WaterWise Program Sponsorship - part of Groundwater Reduction Plan	Current		75,000	75,000	75,000			
Demand	Water Conservation Branding and Marketing	FY 10	FY 10	2,000	-	-	-	-	
Demand	H2O to Go Education Program	FY 10	FY 10	-	-	2,000	-	2,000	
Supply	EPA's WaterSense program Investigate / Incorporate elements	FY 10	FY 10	-	-	-	-	-	Staff Time
Demand	Landscape Design/Conversion to Xeriscaping - Education	FY 10	FY 11	-	1,000	1,000	1,000	1,000	
Demand	Commercial Kitchen Sink Spray-Nozzle Replacement	FY 10	FY 11	-	2,500	2,500	2,500	2,500	
Demand	Water Efficient Technology - Small Device Distribution Program	FY 10	FY 11	-	8,000	10,000	10,000	10,000	
Demand	Water Efficient Technology - Residential Toilet Replacement / Retrofit Incentive Program	FY 10	FY 11	-	20,000	20,000	20,000	20,000	
Demand	Residential Water Use and Efficency Surveys	FY 11	FY 11	-	6,000	5,000	5,000	5,000	$100 / survey
Demand	Rainwater Harvesting - Demonstration Site	FY 11	FY 11	-	700	400	400	400	
Demand	Rainwater Harvesting - Residential Incentive Program	FY 11	FY 12	-	11,500	11,500	16,000	16,000	$125 / barrel
Demand	Landscape Design/Conversion to Xeriscaping-Residential - Water Efficient Plant Rebate	FY 11	FY 12	-		10,000	10,000	10,000	
Supply	Water Conservation Measures in Local Hotels - Promote	FY 11	FY 12	-	300	500	500	500	
Demand	Golf Course Water Efficiency	FY 11	FY 12	-	-	500	TBD	TBD	
Demand	Athletic Field, Park, & Lake Conservation Program	FY 11	FY 13	-	-	Parks	Parks	Parks	retrofit
Supply	Non-Potable/Reuse Water Projects - Scalping Plants	FY 11	FY 15	CIP Funding per Project					Staff Time
Demand	Landscape Irrigation Conservation Incentives - System Consultation	FY 11	FY12	-	-	5,500	5,500	5,500	

		Water Conservation Coordinator	FY 12	FY 12			35,000	35,000	35,000	
Supply		New Construction Graywater Systems - *Requires plumbing code change*	FY 12	FY 13	-	-	-	-	-	Staff Time
Demand		Landscape Irrigation Conservation Incentives - Smart Sensors	FY 13	FY 14	-	-	-	TBD	TBD	
Demand		Water Efficient Technology - Residential Washing Machine Replacement Incentive Program	FY 13	FY 14	-	-	-	16,000	16,000	
less Waterwise (funded by GRP)					2,000	50,000	103,900	121,900	123,900	
					77,000	125,000	178,900	121,900	123,900	

		Proposed Programs	Develop	Implement	FY 10	FY 11	FY 12	FY 13	FY 14	Notes
Demand		Water Conservation Branding and Marketing	FY 10	FY 10	2,000	–	–	–	–	
Demand		H2O to Go Education Program	FY 10	FY 10	–	–	2,000	–	2,000	
Supply		EPA's WaterSense program Investigate / Incorporate elements	FY 10	FY 10	–	–	–	–	–	Staff Time
Demand		Landscape Design/Conversion to Xeriscaping – Education	FY 10	FY 11	–	1,000	1,000	1,000	1,000	
Demand		Commercial Kitchen Sink Spray-Nozzle Replacement	FY 10	FY 11	–	2,500	2,500	2,500	2,500	
Demand		Water Efficient Technology – Small Device Distribution Program	FY 10	FY 11	–	8,000	10,000	10,000	10,000	
Demand		Water Efficient Technology – Residential Toilet Replacement / Retrofit Incentive	FY 10	FY 11	–	20,000	20,000	20,000	20,000	
Demand		Residential Water Use and Efficency Surveys	FY 11	FY 11	–	6,000	5,000	5,000	5,000	$100/ survey
Demand		Rainwater Harvesting – Demonstration Site	FY 11	FY 11	–	700	400	400	400	
Demand		Rainwater Harvesting – Residential Incentive Program	FY 11	FY 12	–	11,500	11,500	16,000	16,000	$125/ barrel
Demand		Landscape Design/Conversion to Xeriscaping-Residential – Water Efficient	FY 11	FY 12	–		10,000	10,000	10,000	
Supply		Water Conservation Measures in Local Hotels - Promote	FY 11	FY 12	–	300	500	500	500	
Demand		Golf Course Water Efficiency	FY 11	FY 12	–	–	500	TBD	TBD	
Demand		Athletic Field, Park, & Lake Conservation Program	FY 11	FY 13	–	–	Parks	Parks	Parks	rebate
Supply		Non-Potable/Reuse Water Projects – Studying Plants	FY 11	FY 15	CIP Funding per Project					Staff Time
Demand		Landscape Irrigation Conservation Incentives – System Consultation	FY 11	FY 12	–	–	5,500	5,500	5,500	
		Water Conservation Coordinator	FY 12	FY 12			35,000	35,000	35,000	
Supply		New Construction Greywater Systems – Requires plumbing code change	FY 12	FY 13	–	–	–	–	–	Staff Time
Demand		Landscape Irrigation Conservation Incentives – Smart Sensors	FY 13	FY 14	–	–	–	TBD	TBD	
Demand		Water Efficient Technology – Residential Washing Machine Replacement Incentive	FY 13	FY 14	–	–	–	16,000	16,000	
		less Weatherise (funded by GRP)			2,000	50,000	103,900	121,900	123,900	
					77,000	125,000	178,900	121,900	123,900	